"TOWARD OPERATIONAL OCEAN STATE ESTIMATION"

Ichiro Fukumori, Benyang Tang, Dimitris Menemenlis, Zhangfan Xing,
Tong Lee, Benny Cheng, and Lee-Lueng Fu

Jet Propulsion Laboratory, California Institute of Technology

Presenting author:
Ichiro Fukumori
MS 300-323
Jet Propulsion Laboratory
4800 Oak Grove Drive
Pasadena, CA 91109
Phone: 818-354-6965
Email: if@pacific.jpl.nasa.gov

Abstract:

An ocean data assimilation system is being developed so as to
routinely estimate the time-evolving, global, three-dimensional state
of ocean circulation. Satellite remote sensing, such as
TOPEX/POSEIDON, has been providing tantalizing observations of changes
in ocean circulation associated with El Nino/La Nina and possibly
other longer-term climate changes (e.g., Pacific Decadal Oscillation).
The assimilation system aims to extend such surface monitoring
capabilities of satellites to estimate the entire three-dimensional
state of the ocean by combining satellite measurements with in situ
observations using ocean models.

By way of example, analyses will be described of an ocean circulation
estimate from 1993 to 2000 obtained by assimilating TOPEX/POSEIDON sea
level data into a near-global ocean general circulation model. The
assimilation reveals the depth dependent circulation underlying
observed changes in sea level. Dominant processes controlling
observed variabilities will be analyzed with particular focus on
changes associated with the 1997-99 El Nino-La Nina event. The model
used is based on a primitive equation model (MIT GCM) that employs
advanced mixing schemes (GM, KPP). A new approximate Kalman filter is
devised so as to estimate circulation at high resolution.